

What is claimed is:

1. A liquid crystal display apparatus comprising:  
a first plastic substrate;  
a light-emitting device formed over the first plastic substrate;  
5 a resin covering the light-emitting device;  
a semiconductor device formed on the insulating film;  
a liquid crystal cell electrically connected to the semiconductor device; and  
a second plastic substrate,  
wherein the semiconductor device and the liquid crystal cell are formed  
10 between the first plastic substrate and the second plastic substrate.

2. A liquid crystal display apparatus comprising:  
a first plastic substrate having a concave portion;  
a light-emitting device formed in the concave portion of the first plastic  
15 substrate;  
a resin formed in the concave portion to cover the light-emitting device;  
an insulating film formed on the resin;  
a semiconductor device formed on the insulating film;  
a liquid crystal cell electrically connected to the semiconductor device; and  
20 a second plastic substrate,  
wherein the semiconductor device and the liquid crystal cell are formed  
between the first plastic substrate and the second plastic substrate.

3. A liquid crystal display apparatus comprising:  
25 a first plastic substrate;  
a metal film formed on the first plastic substrate;  
a light-emitting device formed over the first plastic substrate;  
a resin covering the light-emitting device;  
an insulating formed on the resin;  
30 a semiconductor device formed on the insulating film;

a liquid crystal cell electrically connected to the semiconductor device; and  
a second plastic substrate,  
wherein the semiconductor device and the liquid crystal cell are formed  
between the first plastic substrate and the second plastic substrate.

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4. A liquid crystal display apparatus comprising:  
a first plastic substrate having a concave portion;  
a metal film and formed over the concave portion;  
a light-emitting device formed in the concave portion;  
10 a resin formed in the concave portion to cover the light-emitting device;  
an insulating film formed on with the resin;  
a semiconductor device formed on the insulating film;  
a liquid crystal cell electrically connected to the semiconductor device; and  
a second plastic substrate,  
15 wherein the semiconductor device and the liquid crystal cell are formed  
between the first plastic substrate and the second plastic substrate.

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5. A liquid crystal display apparatus according to any one of claims 3 and 4,  
wherein the metal film is sand blasted.

6. A liquid crystal display apparatus according to any one of claims 1 to 4,  
wherein the liquid crystal cell is transparent to light.

7. A liquid crystal display apparatus according to claim 1, wherein the  
25 light-emitting device is a light-emitting diode.

8. A liquid crystal display apparatus according to claim 7, wherein the  
light-emitting diode is connected to an FPC and supplied with current via the FPC.

30 9. A liquid crystal display apparatus according to claim 2, wherein the

light-emitting device is a light-emitting diode.

10. A liquid crystal display apparatus according to claim 9, wherein the light-emitting diode is connected to an FPC and supplied with current via the FPC.

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11. A liquid crystal display apparatus according to claim 3, wherein the light-emitting device is a light-emitting diode.

12. A liquid crystal display apparatus according to claim 11, wherein the light-emitting diode is connected to an FPC and supplied with current via the FPC.

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13. A liquid crystal display apparatus according to claim 4, wherein the light-emitting device is a light-emitting diode.

14. A liquid crystal display apparatus according to claim 13, wherein the light-emitting diode is connected to an FPC and supplied with current via the FPC.

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15. A cellular phone having the liquid crystal display apparatus according to any one of claims 1 to 4.

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16. An electronic book having the liquid crystal display apparatus according to any one of claims 1 to 4.

17. A wrist watch having the liquid crystal display apparatus according to any one of claims 1 to 4.

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18. A personal computer having the liquid crystal display apparatus according to any one of claims 1 to 4.

19. A front glass having the liquid crystal display apparatus according to any

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one of claims 1 to 4.

20. An electronic card having the liquid crystal display apparatus according to any one of claims 1 to 4.

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21. A method for manufacturing a liquid crystal display apparatus comprising the steps of:

forming sequentially a metal film, a metal oxide film, an insulating film, and a semiconductor film over either face of a first substrate;

10 forming a semiconductor device by the semiconductor film;

pasting a second substrate with a first adhesive onto the first substrate to face the first substrate in such a way that the semiconductor device is sandwiched therebetween;

crystallizing the metal oxide film by heat treatment;

15 separating the first substrate by splitting the metal oxide film into two, each of which is adhered to the metal film and the insulating film;

forming a light-emitting device over a plastic substrate and coating the plastic substrate with a resin so as to cover the light-emitting device;

20 pasting the semiconductor device onto the plastic substrate by bonding the insulating film adhered with a part of the metal oxide film to the resin with a third adhesive;

separating the second substrate by removing the first adhesive; and

forming a liquid crystal cell electrically connected to the semiconductor device.

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22. A method for manufacturing a liquid crystal display apparatus comprising the steps of:

forming sequentially a metal film, a metal oxide film, an insulating film, and a semiconductor film over either face of a first substrate;

30 forming a semiconductor device by the semiconductor film;

pasting a second substrate with a first adhesive onto the first substrate to face the first substrate in such a way that the semiconductor device is sandwiched therebetween;

5 separating the first substrate by splitting the metal oxide film into two, each of which is adhered to the metal film side and the insulating film side;

forming a light-emitting device over a plastic substrate and coating the plastic substrate with a resin so as to cover the light-emitting device;

10 pasting the semiconductor device onto the plastic substrate by bonding the insulating film adhered with a part of the metal oxide film to the resin with a third adhesive;

separating the second substrate by removing the first adhesive;

forming a liquid crystal cell electrically connected to the semiconductor device; and

15 crystallizing the metal oxide film by heat treatment in forming the semiconductor device.

23. A method for manufacturing a liquid crystal display apparatus comprising the steps of:

20 forming sequentially a metal film, a metal oxide film, an insulating film, and a semiconductor film over either face of a first substrate;

forming a semiconductor device by the semiconductor film;

pasting a second substrate with a first adhesive onto the first substrate to face the first substrate in such a way that the semiconductor device is sandwiched therebetween;

25 crystallizing the metal oxide film by heat treatment;

separating the first substrate by splitting the metal oxide film into two, each of which is adhered to the metal film side and the insulating film side;

forming a light-emitting device in a concave portion of a plastic substrate and coating the concave portion with a resin so as to cover the light-emitting device;

30 pasting the semiconductor device onto the plastic substrate by bonding the

insulating film adhered with a part of the metal oxide film to the resin with a third adhesive;

separating the second substrate by removing the first adhesive; and

forming a liquid crystal cell electrically connected to the semiconductor  
5 device.

24. A method for manufacturing a liquid crystal display apparatus comprising the steps of:

forming sequentially a metal film, a metal oxide film, an insulating film, and  
10 a semiconductor film over either face of a first substrate;

forming a semiconductor device by the semiconductor film;

pasting a second substrate with a first adhesive onto the first substrate to face the first substrate in such a way that the semiconductor device is sandwiched therebetween;

15 separating the first substrate by splitting the metal oxide film into two, each of which is adhered to the metal film side and the insulating film side;

forming a light-emitting device in a concave portion of a plastic substrate and coating the concave portion with a resin so as to cover the light-emitting device;

pasting the semiconductor device onto the plastic substrate by bonding the  
20 insulating film adhered with a part of the metal oxide film to the resin with a third adhesive;

separating the second substrate by removing the first adhesive;

forming a liquid crystal cell electrically connected to the semiconductor device; and

25 crystallizing the metal oxide film by heat treatment in forming the semiconductor device.

25. A method for manufacturing a liquid crystal display apparatus comprising the steps of:

30 forming sequentially a metal film, a metal oxide film, an insulating film, and

a semiconductor film over either face of a first substrate;

forming a semiconductor device by the semiconductor film;

forming a liquid crystal cell which is electrically connected to the semiconductor device;

5 pasting a second substrate with a first adhesive onto the first substrate to face the first substrate in such a way that the semiconductor device and the liquid crystal cell are sandwiched therebetween;

crystallizing the metal oxide film by heat treatment;

10 separating the first substrate by splitting the metal oxide film into two, each of which is adhered to the metal film side and the insulating film side;

forming a light-emitting device over a plastic substrate;

coating the plastic substrate with a resin so as to cover the light-emitting device;

15 pasting the semiconductor device and the liquid crystal cell onto the plastic substrate by bonding the insulating film adhered with a part of the metal oxide film to the resin with a third adhesive; and

separating the second substrate by removing the first adhesive.

26. A method for manufacturing a liquid crystal display apparatus  
20 comprising the steps of:

forming sequentially a metal film, a metal oxide film, an insulating film, and a semiconductor film over either face of a first substrate;

forming a semiconductor device by the semiconductor film;

25 forming a liquid crystal cell which is electrically connected to the semiconductor device;

pasting a second substrate with a first adhesive onto the first substrate to face the first substrate in such a way that the semiconductor device and the liquid crystal cell are sandwiched therebetween;

30 separating the first substrate by splitting the metal oxide film into two, each of which is adhered to the metal film side and the insulating film side;



forming a light-emitting device over a plastic substrate;  
coating the plastic substrate with a resin so as to cover the light-emitting device;

5       pasting the semiconductor device and the liquid crystal cell onto the plastic substrate by bonding the insulating film adhered with a part of the metal oxide film to the resin with a third adhesive;

          separating the second substrate by removing the first adhesive; and  
          crystallizing the metal oxide film by heat treatment in forming the semiconductor device.

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27. A method for manufacturing a liquid crystal display apparatus comprising the steps of:

          forming sequentially a metal film, a metal oxide film, an insulating film, and a semiconductor film over either face of a first substrate;

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          forming a semiconductor device by the semiconductor film;

          forming a liquid crystal cell electrically connected to the semiconductor device;

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          pasting a second substrate with a first adhesive onto the first substrate to face the first substrate in such a way that the semiconductor device and the liquid crystal cell are sandwiched therebetween;

          crystallizing the metal oxide film by heat treatment;

          separating the first substrate by splitting the metal oxide film into two, each of which is adhered to the metal film side and the insulating film side;

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          forming a light-emitting device in a concave portion of a plastic substrate and coating the concave portion with a resin so as to cover the light-emitting device;

          pasting the semiconductor device and the liquid crystal cell onto the plastic substrate by bonding the insulating film adhered with a part of the metal oxide film to the resin with a third adhesive; and

          separating the second substrate by removing the first adhesive.

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28. A method for manufacturing a liquid crystal display apparatus comprising the steps of:

forming sequentially a metal film, a metal oxide film, an insulating film, and a semiconductor film over either face of a first substrate;

5 forming a semiconductor device by the semiconductor film;

forming a liquid crystal cell which is electrically connected to the semiconductor device;

10 pasting a second substrate with a first adhesive onto the first substrate to face the first substrate in such a way that the semiconductor device and the liquid crystal cell are sandwiched therebetween;

separating the first substrate by splitting the metal oxide film into two, each of which is adhered to the metal film side and the insulating film side;

forming a light-emitting device in a concave portion of a plastic substrate and coating the concave portion with a resin so as to cover the light-emitting device;

15 pasting the semiconductor device and the liquid crystal cell onto the plastic substrate by bonding the insulating film adhered with a part of the metal oxide film to the resin with a third adhesive;

separating the second substrate by removing the first adhesive; and

20 crystallizing the metal oxide film by heat treatment in forming the semiconductor device.

29. A method for manufacturing a liquid crystal display apparatus according to any one of claims 21 to 28, wherein the liquid crystal cell is transparent to light.

25 30. A method for manufacturing a liquid crystal display apparatus according to claim 21, wherein the light-emitting device is a light-emitting diode.

31. A method for manufacturing a liquid crystal display apparatus according to claim 30, wherein the light-emitting diode is connected to an FPC and supplied  
30 with current via the FPC.

32. A method for manufacturing a liquid crystal display apparatus according to claim 22, wherein the light-emitting device is a light-emitting diode.

5 33. A method for manufacturing a liquid crystal display apparatus according to claim 32, wherein the light-emitting diode is connected to an FPC and supplied with current via the FPC.

34. A method for manufacturing a liquid crystal display apparatus according to claim 23, wherein the light-emitting device is a light-emitting diode.

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35. A method for manufacturing a liquid crystal display apparatus according to claim 34, wherein the light-emitting diode is connected to an FPC and supplied with current via the FPC.

15 36. A method for manufacturing a liquid crystal display apparatus according to claim 24, wherein the light-emitting device is a light-emitting diode.

37. A method for manufacturing a liquid crystal display apparatus according to claim 36, wherein the light-emitting diode is connected to an FPC and supplied  
20 with current via the FPC.

38. A method for manufacturing a liquid crystal display apparatus according to claim 25, wherein the light-emitting device is a light-emitting diode.

25 39. A method for manufacturing a liquid crystal display apparatus according to claim 38, wherein the light-emitting diode is connected to an FPC and supplied with current via the FPC.

40. A method for manufacturing a liquid crystal display apparatus according to claim 26, wherein the light-emitting device is a light-emitting diode.

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41. A method for manufacturing a liquid crystal display apparatus according to claim 40, wherein the light-emitting diode is connected to an FPC and supplied with current via the FPC.

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42. A method for manufacturing a liquid crystal display apparatus according to claim 27, wherein the light-emitting device is a light-emitting diode.

43. A method for manufacturing a liquid crystal display apparatus according to claim 42, wherein the light-emitting diode is connected to an FPC and supplied with current via the FPC.

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44. A method for manufacturing a liquid crystal display apparatus according to claim 28, wherein the light-emitting device is a light-emitting diode.

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45. A method for manufacturing a liquid crystal display apparatus according to claim 44, wherein the light-emitting diode is connected to an FPC and supplied with current via the FPC.